Research Note

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SITE INDEX CURVES FOR GRAND FIR IN THE INLAND EMPIRE

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Growth, yield, and silvicultural practice vary with differing site quality. The accompanying diagrams provide a means of rating site quality for grand fir in the Inland Empire.

The concept of site classification used in constructing these curves is based on two points:

1. Grand fir is a tolerant species. Therefore, its early growth rate is determined largely by competition of surrounding or overtopping vegetation rather than by site quality.

2. Site quality is defined here by the height age relation of the 25 largest dominants per acre. A constant number of sample trees per acre is necessary because these curves are drawn from data for the growth rate of individual trees rather than from measurements of dominant stand height. The number of trees actually to be measured depends on the precision desired and the variation encountered.

Site index for grand fir is defined by these curves in proportion to the height increment attainable on dominant trees at a height of 55 feet. Thus the influence of early competition on site classification is reduced. Furthermore, a rating related to increment should provide a flexible approach that can be elaborated upon by correlations with edaphic or ecologic conditions.

The units of site index used are height in feet at a breast-height age of 38 years. This corresponds roughly to a total age of 50 years. Hence grand fir site index, although based on height increment, is expressed in the customary terms of total height at a key index age.

HOW TO USE THESE CURVES

1. Select dominant grand fir trees at the rate of 25[1/] trees per acre of sample area that do not show evidence of top damage. For example, five dominants would be selected on a 1/5-acre plot. If the site is to be determined for a larger area, one tree per 1/25-acre plot could be measured on as many plots as necessary to give a satisfactory average site index. Probably no fewer than a total of five trees should be measured to classify the site index of a small area.

2. Measure:

   a. Total height in feet.
   b. Age at breast height.
   c. Number of rings in 1.5-inch radius from pith at breast height.[2/]

3. Select the set of curves (figs. 1, 2, 3, or 4) that corresponds to the number of rings in 1.5-inch radius from pith at breast height.

4. Determine the site index for each tree according to its position on the curves of the site index diagram selected.

5. Average the several site indices obtained to arrive at a rating for the area.

If the number of rings in 1.5-inch radius from pith at breast height is not known, figure 5 may be used for site classification. Its curves are based on a mean number of rings that increases with decreasing site indices.

1/ The rate of 25 trees per acre is a tentative recommendation that may be improved upon in the analysis of a growth study of grand fir now in progress.

2/ For trees more than 150 feet tall, the juvenile growth rate has no effect on the site class. Hence this item is unnecessary for such trees.

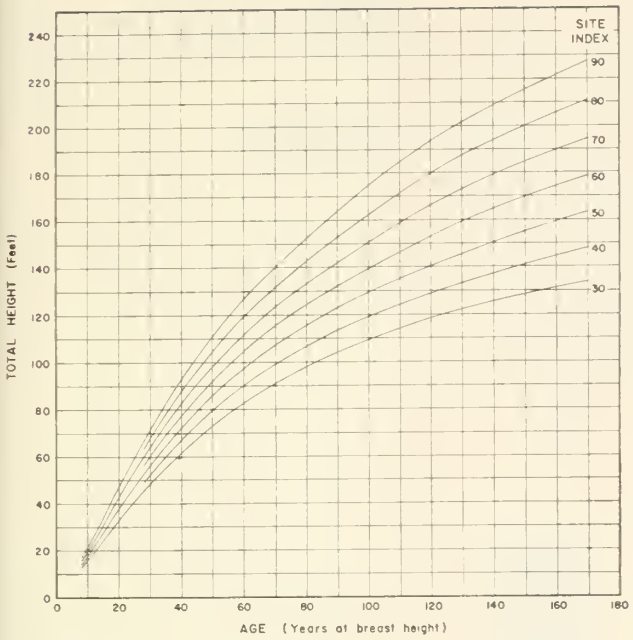

Figure 1.--Site index curves for dominant grand fir trees having 8-12 rings in 1.5-inch radius from pith at breast height.

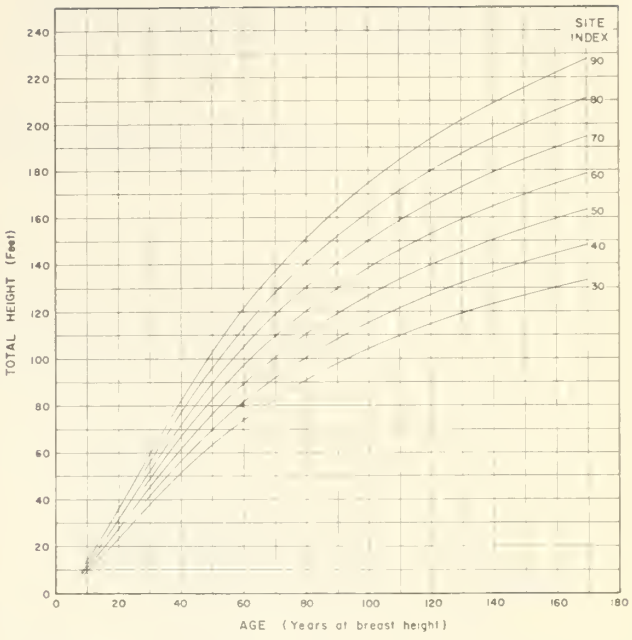

Figure 2.--Site index curves for dominant grand fir trees having 13-17 rings in 1.5-inch radius from pith at breast height.

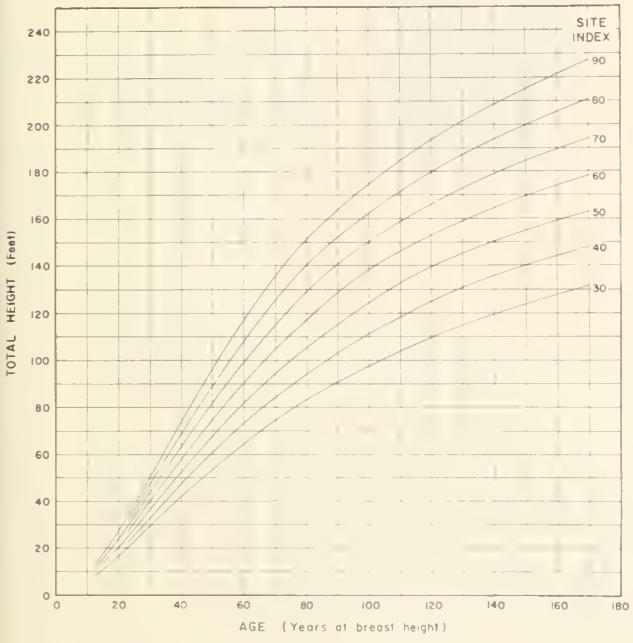

Figure 3.--Site index curves for dominant grand fir trees having 18-22 rings in 1.5-inch radius from pith at breast height.

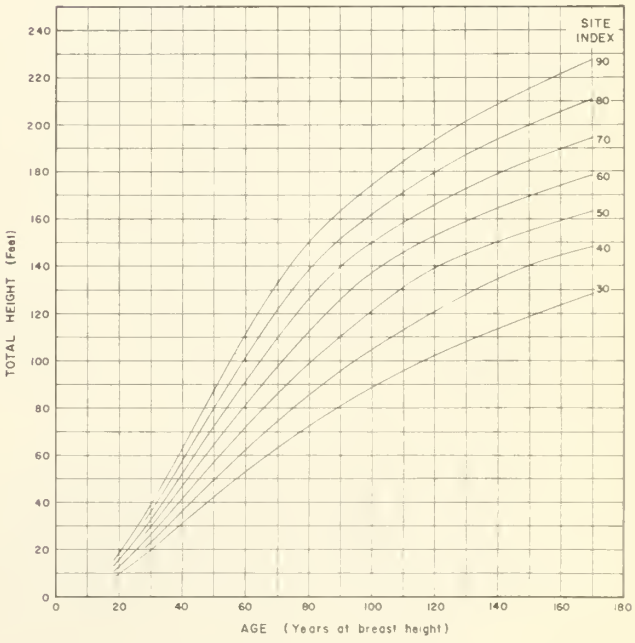

Figure 4.--Site index curves for dominant grand fir trees having 23-27 rings in 1.5-inch radius from pith at breast height.

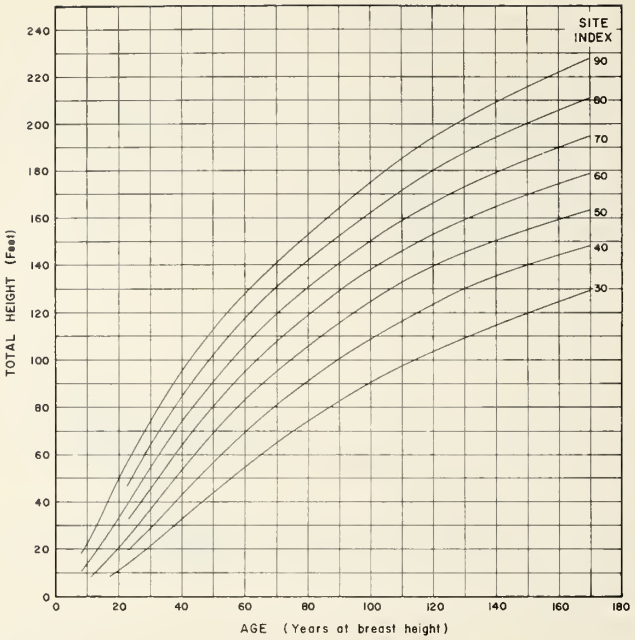

Figure 5.--Site index curves for dominant grand fir trees for which the number of rings in 1.5-inch radius from pith at breast height is not known.